



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
OSB2001-0302-FEC

January 4, 2002

Mr. Lawrence C. Evans
U.S. Army Corps of Engineers
Portland District, CENWP-CO-GP (Monical)
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act
Essential Fish Habitat Consultation, East Broadway Bridge and 12th Avenue Bridge
Replacement Projects, Necanicum River Basin, City of Seaside, Clatsop County, Oregon
(Corps No. 2001-00958)

Dear Mr. Evans:

Enclosed is the biological opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) for the City of Seaside's Bridge Replacement Projects at East Broadway (Neawanna Creek) and 12th Avenue (Necanicum River). The NMFS concludes in this Opinion that the proposed action is not likely to jeopardize Oregon Coast coho salmon (*Oncorhynchus kisutch*) or destroy or adversely modify critical habitat. Pursuant to section 7 of the ESA, NMFS has included reasonable and prudent measures with non-discretionary terms and conditions that NMFS believes are necessary and appropriate to minimize the potential for incidental take associated with this project.

This Opinion also serves as consultation on Essential Fish Habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR Part 600).

Questions regarding this letter should be directed to Rob Markle of my staff in the Oregon Habitat Branch at (503) 230-5419.

Sincerely,

Michael R. Crouse

D. Robert Lohn
Regional Administrator



Endangered Species Act - Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation


BIOLOGICAL OPINION

East Broadway Bridge and 12th Avenue Bridge Replacement Projects,
Necanicum River Basin, Seaside, Clatsop County, Oregon
(Corps No. 2001-00958)

Agency: U.S. Army Corps of Engineers, Portland District

Consultation Conducted by: National Marine Fisheries Service,
Northwest Region

Date Issued: January 4, 2002

for 

D. Robert Lohn
Regional Administrator

Refer to: OSB2001-0302-FEC

TABLE OF CONTENTS

1. ENDANGERED SPECIES ACT	<u>1</u>
1.1 Background	<u>1</u>
1.2 Proposed Action	<u>1</u>
1.2.1 Common to Both Actions	<u>1</u>
1.2.2 East Broadway Bridge	<u>5</u>
1.2.3 12 th Avenue Bridge	<u>6</u>
1.3 Biological Information and Critical Habitat	<u>6</u>
1.4 Evaluating Proposed Actions	<u>7</u>
1.4.1 Biological Requirements	<u>7</u>
1.4.2 Environmental Baseline	<u>8</u>
1.5 Analysis of Effects	<u>9</u>
1.5.1 Effects of Proposed Actions	<u>9</u>
1.5.2 Effects on Critical Habitat	<u>13</u>
1.5.3 Cumulative Effects	<u>13</u>
1.6 Conclusion	<u>14</u>
1.7 Conservation Recommendations	<u>14</u>
1.8 Reinitiation of Consultation	<u>15</u>
2. INCIDENTAL TAKE STATEMENT	<u>15</u>
2.1 Amount or Extent of Take	<u>15</u>
2.2 Reasonable and Prudent Measures	<u>16</u>
2.3 Terms and Conditions	<u>16</u>
3. MAGNUSON-STEVENSON ACT	<u>20</u>
3.1 Background	<u>20</u>
3.2 Magnuson-Stevens Fishery Conservation and Management Act	<u>20</u>
3.3 Identification of EFH	<u>21</u>
3.4 Proposed Actions	<u>21</u>
3.5 Effects of Proposed Action	<u>21</u>
3.6 Conclusion	<u>22</u>
3.7 EFH Conservation Recommendations	<u>22</u>
3.8 Statutory Response Requirement	<u>22</u>
3.9 Consultation Renewal	<u>23</u>
4. LITERATURE CITED	<u>25</u>

1. ENDANGERED SPECIES ACT

1.1 Background

On December 6, 2001, the National Marine Fisheries Service (NMFS) received a letter from the U.S. Army Corps of Engineers (Corps) requesting consultation for the issuance of a permit under section 10 of the Rivers and Harbors Act and/or section 404 of the Clean Water Act to the City of Seaside (City) for the East Broadway Bridge and 12th Avenue Bridge Replacement Projects in Clatsop County, Oregon. A biological assessment (BA) for the proposed action, prepared by Pacific Habitat Services (PHS) for the City, was provided to the NMFS. The BA indicated that the proposed action was likely to adversely affect Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) under the Endangered Species Act (ESA).

The City of Seaside is a coastal community located along the Highway 101 corridor with a population of approximately 6,000. Tourism constitutes the area's primary source of income. On October 10, 2001, the NMFS participated in a site visit with the Corps, the City, PHS, OBEC Consulting Engineers (OBEC), and the Oregon Department of Fish and Wildlife (ODFW) to discuss the proposed actions.

This biological opinion (Opinion) considers the potential effects of the proposed action on OC coho salmon, which occur in the proposed project area. OC coho salmon were listed as threatened under the Endangered Species Act (ESA) on August 10, 1998 (63 FR 42587). Critical habitat was designated on February 16, 2000 (65 FR 7764) and protective regulations were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42423). This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

1.2 Proposed Action

The proposed action is issuance of a permit by the Corps for the demolition and reconstruction of two bridges in the City of Seaside, Oregon. The East Broadway Bridge crossing Neawanna Creek and the 12th Avenue Bridge crossing the Necanicum River.

1.2.1 Common to Both Actions

The proposed actions will replace the existing bridges with multi-span, concrete and steel pile structures. Both actions will involve work within, above, and adjacent to the respective waterways, including structure demolition and reconstruction, pile extraction, and pile driving. Alignments will remain identical to the existing structures, though structure widths will increase. Bridge designs will incorporate stormwater treatment.

The ODFW-recommended work period for these areas is November 1 to February 15. This period is primarily in consideration of estuarine species and conflicts with coho salmon escapement timing. To minimize exposure to returning adult coho salmon, in-water work is proposed to occur between January 1 and February 15. This work period applies to the removal of the existing bridge, removal of existing bridge piles, driving new bridge piles in the channel,

and any work conducted below the ordinary higher-high water elevation or 10-year flood elevation, whichever is greater. In addition, temporary utility support structure piles at the 12th Avenue Bridge will be driven during the work window, though removal will occur in May.

Prior to bridge removal, holes will be cut into the bridge deck and galvanized steel-pipe pile driven for the new bridge piers. Any pile driving done in the wet will occur within a sediment containment barrier. No pre-boring or jetting will occur. The galvanized steel-pipe pile will be filled with concrete following pile driving to provide increased lateral resistance.

Bridge removal will take place in segments. The bridge deck will be cut into pieces and craned off the support structure. Creosote treated wood piles will be extracted via vibratory method from equipment operating on the bridge as deck removal progresses. Any pile extraction done in the wet will occur within a sediment containment barrier. Clean sand collars (approximately 0.27 cubic yards per pile) will be placed around the base of each pile removed to minimize suspension of sediments contaminated with polycyclic aromatic hydrocarbon (PAH).

The contractor will provide containment during demolition and construction to prevent material from entering the waterways. Containment will be in place prior to the commencement of any over water construction operations and remain in place until completion of overhead construction work (approximately April 30).

New abutments will be constructed landward of the existing abutments. Abutment construction will require steel-pipe pile (seven to nine piles per abutment) and sheetpile driving. After the new abutments are completed, the existing abutments will be removed and the native substrate blended to the existing bank contours. Removal and grading would take place during low tide while the bank sediments are not inundated. Silt fencing would be placed around the grading area to contain the entire process and would extend high enough to contain work above the high tide line. No riprap is proposed for use in conjunction with these actions.¹

Pre-cast concrete deck slabs will be craned into place. Concrete pier caps (including shear blocks), sidewalks, and bridge railings will be cast in place. The wearing surface will consist of approximately 2 inches of asphalt concrete placed over a waterproof membrane. All bridge joints will be sealed and stormwater directed via over-deck flow to bridge ends. In addition, the proposed actions will include various approach work. Any large woody material encountered during construction will be placed to the sides of the channel and not removed.

The City has agreed to assume responsibility for maintaining the projects after termination of the construction contract, and will routinely maintain water quality sediment and oil traps at each bridge. Construction will not affect native woody vegetation on the adjacent banks since no woody shrubs or trees are growing in the construction zone. Affected vegetation primarily

¹ Telephone conversation between Greg Ausland, OBEC Consulting Engineers, and Rob Markle, NMFS, regarding proposed action description, December 12, 2001.

consists of sedges.

The City will implement the following best management practices (BMPs) to minimize the impacts of the projects on the fish and their habitat.

1. The contractor will be required by special provisions to develop a Pollution Control Plan (PCP) to prevent these point source types of pollution from occurring. The PCP should include the following:
 - a. A description of methods to be used to prevent erosion and sedimentation that covers sites, borrow pit operations, haul roads, equipment storage sites, fueling operations and staging areas;
 - b. A description of the hazardous products or materials that will be used, including inventorying, storage, handling, and monitoring; and
 - c. A spill containment and control plan with notification procedures; specific clean up and disposal instructions for different products; quick response containment and clean up measures which will be available on site; proposed methods for disposal of spilled materials; and employee training for spill containment.
2. Fueling would occur in designated staging locations approved by the agencies.
3. To prevent the possibility of fuel or oil reaching the stream or wetlands, hazardous substances, chemicals, fuels and lubricating oils will not be stored within 100 feet of the stream.
4. Petroleum products, chemicals, or other deleterious materials will not be allowed to enter either stream, and no fresh concrete will come in contact with the active flowing stream.
5. Waste materials and spoils not utilized in the project will be removed from the site and disposed of in an appropriate upland location.
6. All contractor employees and subcontractors will be required to receive training in procedures to prevent erosion and spills.
7. All erosion control devices shall be inspected weekly, at a minimum, during construction to ensure that they are working adequately.
8. Install all erosion and sediment control measures within 150 feet horizontal distance of the waterway prior to any other work in this area.
9. Erosion control materials (i.e., silt fence, straw bales, biobags, aggregate, etc.) in excess of those installed shall be available on site for immediate use during emergency erosion control needs.
10. Containment measures adequate to prevent construction and demolition materials from

entering any waterway shall be implemented. Waterway shall be defined as that area below the mean higher-high water elevation or 10-year flood elevation, whichever is greater.

11. Steel coatings of the existing structure shall be considered to contain a red lead pigment primer, unless determined otherwise by laboratory findings. All timbers on the existing structure are to be considered treated. The contractor will comply with all relevant requirements of federal, state, and local regulations and requirements applicable to the disposal of contaminated materials.
12. A turbidity curtain shall be used to contain suspended sediments during all pile removal and pile driving done in the wet.
13. Prior to removal of treated-wood pile, a clean sand collar of minimum 12-inch depth shall encircle the base of each pile.
14. Existing piles shall be extracted. Piles that break during removal shall be cut below the streambed and covered to a minimum depth of 12 inches with clean sand.
15. An oil absorbing, floating boom shall be available on-site during all phases of construction.
16. Vehicles operated within 150 feet of the waterway shall be free of fluid leaks. Daily examination of vehicles for fluid leaks is required during periods operated within or above the waterway.
17. No pollutants of any kind (sewage, waste spoils, petroleum products, fresh concrete cured less than 48 hours, silt, welding slag and grindings, concrete saw cutting by-products, sandblasting abrasive, etc.) shall come in contact with the waterbody or wetlands nor their substrate below the mean higher-high water elevation or 10-year flood elevation, whichever is greater.
18. Any areas used for staging, access roads, or storage are to be evacuated and all materials, equipment, and fuel shall be removed if flooding of the area is expected to occur within 24 hours.
19. Vehicle maintenance, re-fueling of vehicles and storage of fuel shall be done at least 150 feet from the waterway.
20. At the end of each work shift, vehicles shall not be stored within or over the waterway.
21. Prior to operating within the waterway, all equipment shall be cleaned of external oil, grease, dirt or caked mud. Any washing of equipment shall be conducted greater than

150 feet from the waterway and in a location that shall not contribute untreated wastewater to any flowing stream.

22. No pre-boring or jetting shall occur without prior toxicity testing of the sediments.
23. No surface application of fertilizer shall be permitted within 50 feet of the waterway.
24. No herbicide application shall occur as part of this project. Mechanical removal of undesired vegetation and root nodes is permitted.
25. Temporary erosion and sediment controls will be used on all exposed slopes during any hiatus in work exceeding 7 days.
26. Exposed soil surfaces will be permanently stabilized at finished grade with native grass seeding and mulch.

1.2.2 East Broadway Bridge

The East Broadway Bridge crosses Neawanna Creek at river mile 2.1. Built in 1956, the bridge is a seven span, wooden structure with an asphalt-concrete travel surface supported by 30 treated wood pilings. The structure is showing signs of structural deficiency.

The proposed bridge (148 feet x 46 feet) would consist of three 49-foot long spans. The precast concrete slab superstructure would be supported by two piers. Each pier consists of seven galvanized steel-pipe piles (14 piles) driven to refusal and filled with concrete. The new bridge abutments would be constructed landward of the existing abutments. The widened road prism will cover 860 square feet of wetlands with fill.

Construction would begin by removing the three center spans of the existing bridge, constructing the two new piers, and setting the precast center slab in place. Adjacent spans of the existing bridge would be removed and work would proceed toward the abutments. During removal of the existing bridge, an *enviroscreen* tarp would be suspended under the deck from pier cap to pier cap to contain any material dropping off the deck.

Stormwater runoff from the proposed bridge would be collected and conveyed over the deck to two concrete collection boxes at the east end of the bridge, one on each side of the road. Each box will have an oil and sediment trap, which will be routinely maintained by the City of Seaside following construction. Outflow from collection boxes would be piped to the north side of the road through a 12-inch storm pipe into a rock lined scour basin. At most flows, runoff would travel over-ground from the scour basin to Neawanna Creek.

1.2.3 12th Avenue Bridge

The 12th Avenue Bridge crosses the Necanicum River at river mile 1.2. Built in 1952, the existing bridge is an eight span, cast in place, reinforced concrete deck girder structure supported

by 35 treated wood piles. The structure is showing signs of structural deficiency and the abutments are showing evidence of scour.

The proposed bridge (249 feet x 59 feet) would consist of four spans of variable length ranging from 59 to 66 feet. Similar to the proposed East Broadway Bridge, the precast concrete slab superstructure would be supported on steel piles and the abutments constructed landward of the existing abutments. Nine concrete filled, galvanized steel-pipe pilings will support the structure at three piers for a total of 27 in-water steel pilings. Any material falling from the bridge span will be collected on non-motorized flexible barges (7 feet x 35 feet) fastened underneath the bridge. No petroleum products will be placed on the barges. It is anticipated that the center two precast spans of the new bridge would be placed first after Pier 3 is completed.

Stormwater draining off the bridge will be routed from the center of the bridge east and west to water quality manholes which will trap sediment and oil. From the manholes, runoff will be piped to rock lined energy dissipaters (one per bank) where it will travel over ground to the river.

In addition, a 52.5-foot long retaining wall will be constructed to protect a wetland, and a temporary walkway/utility support will be built immediately upstream of the 12th Avenue Bridge. The retaining wall will be north of the western approach, oriented perpendicular to the Necanicum River. The temporary support structure will house the main town sewer line, possibly a gas line and a water line, a pedestrian walkway, and be constructed using 14 steel piles (two piles per bent). This structure will be in place from the start of the project until the bridge reopens in the spring (approximately May).

1.3 Biological Information and Critical Habitat

Although there are currently limited data to assess population numbers or trends, NMFS believes that all coho salmon stocks comprising the OC coho salmon Evolutionarily Significant Unit (ESU) are depressed relative to past abundance. The status and relevant biological information concerning OC coho salmon are well described in the proposed and final rules from the Federal Register (60 FR 38011, July 25, 1995; and 63 FR 42587, August 10, 1998, respectively), and Weitkamp *et al.* (1995).

Abundance of wild coho salmon spawners in Oregon coastal streams declined during the period from about 1965 to roughly 1975 and has fluctuated at a low level since that time (Nickelson *et al.* 1992). Spawning escapements for this ESU may be at less than 5 percent of abundance from that in the early 1900s. Contemporary production of coho salmon may be less than 10 percent of the historic production (Nickelson *et al.* 1992). Average spawner abundance has been relatively constant since the late 1970s, but preharvest abundance has declined. Average recruits-per-spawner may also be declining. The OC coho salmon ESU, although not at immediate danger of extinction, may become endangered in the future if present trends continue (Weitkamp *et al.* 1995).

Timing of adult coho salmon river entry is largely influenced by river flow. Coho salmon normally wait for fall freshets before entering rivers. In the Necanicum River watershed, adults return between mid-October and mid-January. OC coho salmon spawn in the Necanicum River basin between mid-November and late-January with peak spawning occurring in late-November (Weitkamp *et al.* 1995). Neawanna Creek populations are believed to mirror those found in the Necanicum River. Juvenile coho salmon rear for one year in freshwater before migrating to the ocean. Spawning and juvenile rearing generally take place in small low gradient (generally less than 3 percent) tributary streams (Floyd 2000). Juvenile OC coho salmon migrate out of the Necanicum River basin as smolts between March and early June.

Critical habitat for OC coho salmon includes Oregon coastal river basins (freshwater and estuarine areas) between Cape Blanco and the Columbia River. Freshwater critical habitat includes all waterways, substrates, and adjacent riparian areas below longstanding, natural impassable barriers (i.e., natural waterfalls in existence for at least several hundred years) and several dams that block access to former coho salmon habitat. Riparian areas include areas adjacent to a stream that provide the following functions: shade, sediment, nutrient or chemical regulation, streambank stability, and input of large woody material (LWM) or organic matter. The proposed actions would occur in critical habitat designated for OC coho salmon.

1.4 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NMFS uses the following steps: (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild or adversely modify its critical habitat. In completing this step of the analysis, NMFS determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the continued existence of the listed species or result in destruction, adversely modify their critical habitat, or both. If NMFS finds that the action is likely to jeopardize the listed species, NMFS must identify reasonable and prudent alternatives for the action.

1.4.1 Biological Requirements

The first step in the methods NMFS uses for applying the ESA section 7(a)(2) to listed salmon is to define the biological requirements of the species most relevant to each consultation. NMFS also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NMFS starts with the determinations made in its decision to list OC coho salmon under the ESA and also considers new data available that are relevant to the determination (Weitkamp *et al.* 1995).

The relevant biological requirements are those necessary for OC coho salmon to survive and recover to naturally reproducing population levels at which protection under the ESA will become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are habitat characteristics that function to support successful rearing and migration. The current status of the OC coho salmon, based upon their risk of extinction, has not significantly improved since the species was listed and, in some cases, their status may have worsened.

1.4.2 Environmental Baseline

The environmental baseline is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect affects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. For this consultation, the action area includes the affected streambed, bankline, adjacent riparian zone, and aquatic areas from the project site downstream to the Pacific Ocean, and upstream approximately 0.5 miles due to tidal influence.

The bulk of production for the OC coho salmon ESU is skewed to its southern portion where the coastal lake systems (e.g. Tenmile, Tahkenitch, and Siltcoos Basins) and the Coos and Coquille Rivers are more productive. Necanicum River coho salmon populations have been characterized as depressed (e.g., spawning habitat under-seeded, declining trends, or recent escapements below long-term average) and at moderate risk of extinction (Weitkamp *et al.* 1995). OC coho salmon are known to spawn in the Necanicum River and Neawanna Creek, and use the waterways for rearing.

Neawanna Creek

Neawanna Creek is a small coastal stream with headwaters in the local mountains southeast of the City of Seaside. The creek is approximately 5.4 miles long and drains the small watersheds immediately east of the city. Tributaries include Mill Creek, Thompson Creek, and Sunquist Creek. Flows are discharged into the Necanicum estuary approximately 0.5 mile from the Pacific Ocean.

In the subject reach, Neawanna Creek is tidal and slightly channelized with stream banks stabilized primarily by non-native vegetation. Rock riprap and timber bulkheads are found at the existing bridge abutments. Fill material has encroached upon the historic floodplain for the bridge approaches and to provide development along adjacent banks. The bridge may function

as a control point at some flows and prevents natural channel migration. A small stand of conifers and hardwoods exist southeast of the eastern bridge approach. The western bank and northern portion of the eastern bank are sparsely vegetated. Halophytic sedge species grow on the banks near the tidal zone of the river. Non-native species dominate streambank vegetation.

Land use in the watershed includes urban and rural residential, commercial, pasture, RV camping, and logging. Lower reaches of the river are tidal and heavily urbanized. The upper watersheds have been logged. Neawanna Creek is not listed on the Oregon Department of Environmental Quality 303(d) list for water quality (ODEQ 2001).

Necanicum River

The Necanicum River is a small coastal river with a mainstem starting at the base of Humbug Mountain and traveling 21 miles to Seaside where it empties into the Pacific Ocean. Due to the geology of the basin and the shallow aquifer, the Necanicum River rises very quickly during storms, causing high velocity scouring.

The Necanicum River is highly channelized. Stream banks in the project area consist of approximately 6.6-foot tall terraces stabilized by vegetation and riprap. Limited riprap placement has occurred along the bridge footings with associated fill to minimize erosion potential at the end bents. At bank-full flow, this has resulted in a hardpoint constriction to flow. Immediately downstream of the bridge, the constriction causes erosional backwater eddies that have widened the streambed. On the southwest bank just upstream of the bridge, stormwater is delivered to the creek via a 12" concrete pipe. Halophytic sedge species grow on the banks near the tidal zone of the river. The rest of the banks are dominated by non-native species.

Land use in the watershed includes urban and rural residential, commercial, pasture, and logging. Lower reaches of the Necanicum River are tidal and heavily urbanized. The upper watershed has been logged and some large landslides have occurred in the basin. The Necanicum River is on the Oregon Department of Environmental Quality 303(d) list for water quality not meeting the bacteria criterion (ODEQ 2001).

1.5 Analysis of Effects

1.5.1 Effects of Proposed Actions

Estuaries support a diverse and complex community of plants and animals adapted to a habitat exhibiting a unique combination of fresh and salt water characteristics. Human alteration of estuarine habitats has degraded or eliminated estuarine conditions for use by anadromous and marine fish. In addition to large scale actions, the cumulative effects of small actions may have a large systematic affect on estuarine and coastal oceanic carrying capacities (PFMC 1998a). Population and commercial growth contribute pressure to expand coastal towns and port facilities, resulting in a net loss of estuaries and estuarine habitat. Coastal fish populations are dependent upon both the quantity and quality of the available habitat, and almost all marine and

remaining intertidal waters, wetlands, swamps and marshes are critical to fish. For example, submerged aquatic vegetation is critical to nearshore food web dynamics and provides direct habitat value to fish (e.g., protecting juveniles from predators, providing rearing habitat, improving water quality, and controlling sediments). Other estuarine habitats such as mud flats, high salt marsh, and saltmarsh creeks also provide productive shallow water habitat for epibenthic fishes and decapods. Three-fourths of the fish species harvested in the United States are supported by estuarine habitats (PFMC 1998a).

The ODFW anticipates few coho salmon will be present in the action area after January 1.² On the diminishing end of return timing, all but late returning adults will have passed the subject reach for upstream spawning grounds by that date. This is probably particularly true for the 2001 escapement, which has not be delayed by low fall flows. Juvenile salmon presence during the in-water work period will be limited to those individuals potentially displaced from upstream habitat due to winter high flows. Juveniles outmigrating from the systems during March to early-June, may experience behavioral effects while transiting the subject reach; however, the only in-water work authorized to occur during that time period is the removal of the temporary support structure at the 12th Avenue Bridge site.

Project activities could affect juvenile and adult coho salmon present in the action area during and following construction. In the short term, pile extraction and driving may interfere with fish passage due to excessive aquatic noise and increases in turbidity. Turbidity may also impair fish health. The use of barges may increase the predation threat, primarily on juveniles. Long-term affects to fish health may result from suspension and subsequent deposition of sediments contaminated by creosote treated wood piles, reduction in wetland area from an increased road prism, continued predation opportunities by piscivorous birds perched on the elevated over-water structures, and contributory alteration of the hydrologic cycle from increased impervious surface and stormwater drainage management.

Effect #1: Disturbance - Pile driving has the potential to delay adult coho salmon migration and influence juvenile behavior. Salmonids can detect sound frequencies generated by pile driving within a radius of 300 meters (Feist 1996). The use of a vibratory hammer is expected to reduce noise disturbance. Noise vibrations from pile driving and other construction activities, and use of floodlights, likely would cause most fish species to avoid the area.

Effect #2: Turbidity - Pile extraction and driving may increase turbidity through suspension of sediments. An increase in turbidity can impact fish and filter-feeding macro-invertebrates downstream of the work site, as well as upstream on a flood tide. At moderate levels, turbidity can reduce primary and secondary productivity; at higher levels, turbidity may interfere with feeding and may injure and even kill both juvenile

² Personal telephone communication with Joe Sheahan, ODFW, discussing coho salmon use of the Necanicum River and Neawanna Creek, 9 November 2000.

and adult fish (Spence *et al.* 1996, Berg and Northcote 1985).

Turbidity associated with the removal of the existing piles and placement of the new piles will be limited in duration and area. An anchored sediment barrier will be placed around pilings during extraction and driving when work is conducted in the wet. In addition, during treated wood pile extraction, sand collars will be placed around piling bases to minimize suspension of potentially contaminated sediments and back fill the resulting hole in the sediment. Regardless, turbidity may increase during the project's in-water work. Any increase in turbidity may impede the upstream movement of late returning adult coho salmon, and may reduce juvenile health and survival.

Transportation of terrestrial sediments to the waterways is also possible. Ground disturbance activities will expose and dislodge soils. Any precipitation during periods of vulnerability may result in erosion of soils and increases in stream turbidity if erosion control measures are inadequate.

Effect #3: Wetlands - The widened road prism at the East Broadway Bridge will result in an 860-square foot reduction in wetlands. Wetlands provide juvenile coho salmon cover, refugia, and prey items, and help maintain water quality. A National Academy of Science study of compensation for wetland losses through the section 404 mitigation program found that the national goal of no net loss of wetlands is not being met for wetland functions by the mitigation program.³

As mitigation for the lost wetlands, the City will enhance an approximately 2,610 square foot area of low-quality wetland several hundred feet downstream of the bridge on the west bank. Plantings of native trees and shrubs (60 total plants) will improve vegetative structure and diversity on site. The goal is to achieve 80% overall survival at the end of the required monitoring period. Replacement plantings will be required if the survival goals are not met.

In the BA, PHS indicates that enhancement will improve specific wetland functions within the mitigation site. By design, the goal is to offset the wetland functions lost to the increased road prism. However, this intended increase in function does not prevent the net loss of wetland area, which may be used by juvenile coho salmon for cover, refugia, and feeding.

Effect #4: Hazardous Materials - Pile extraction may suspend and distribute contaminated sediments within the subject reaches. Exposure to PAH contaminated sediments leached from creosote piles may adversely affect aquatic organisms. PAH exposure has been associated with liver cancer, lesions, reproductive abnormalities, immune dysfunction,

³ National Academy of Science. 2001. Compensating for Wetland Losses Under the Clean Water Act. National Academy Press, Washington, D.C. Available on-line at <http://www.nap.edu/catalog/10134.html>.

and alterations in growth and development in English sole (*Pleuronectes vetulus*) (Johnson 2000). Even short duration (days or weeks) PAH exposure may result in genetic damage (formation of DNA adducts). Chronic exposure causes accumulation of DNA adducts in fish, which can be used to estimate the likelihood of PAH-related injury to transient residents of urban estuaries, such as migrating salmonids (Johnson 2000). NMFS has determined sediment concentrations of total PAHs above 1,000 ppb substantially increase risk to fish health (Johnson 2000). While the extraction of creosote treated wood piles may cause suspension of some PAH contaminated sediments, removal will reduce the long-term contamination potential in the area. The use of sand collars around pile bases during extraction of treated wood piles should reduce suspension and exposure to contaminated sediments.

Stormwater collection and water quality manholes constitute an improvement over the existing drainage system. The NMFS expects bridge runoff water quality to improve as delivery of roadway contaminants are reduced, assuming facilities are adequately maintained.

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of pile drivers, cranes, backhoes, and other equipment requires the use of fuel, lubricants, etc., which, if spilled into the channel of a water body or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) also contain PAHs, which can cause acute toxicity to salmonids at high levels of exposure and can also cause chronic lethal, as well as acute and chronic sublethal effects, to aquatic organisms (Neff 1985). No toxicants, including petroleum products, will be stored within 100 feet of a waterway.

Herbicides used to clear vegetation may be used in riparian areas, where they may enter water bodies. Exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, as well as target and non-target riparian vegetation (Spence *et al.* 1996). No herbicide use is proposed in association with the subject actions.

Effect #5: Predation - Barges will be used to prevent demolition debris and construction materials from inadvertently entering the waterway at the 12th Avenue Bridge site. The barges will be located in water less than 20 feet deep and be on site prior to commencing in-water work until completion of overhead construction (approximately April 30).

The juvenile coho salmon outmigration occurs from March until early June. Barge presence during juvenile outmigration may result in elevated predation. Piscivorous birds may roost on barge edges, while predatory fish may hide in the shadow of the barges. The low profile of the barges are believed to provide only minimal predatory advantage to piscivorous birds in comparison to the bridge structure itself. The avian predatory threat provided by the new bridges will not constitute an appreciable change in the current risk.

Effect #6: Hydrologic Cycle - Actions associated with transportation projects frequently increase peak storm flows and reduce groundwater-fed low flows. Impervious surfaces and stormwater conveyance systems associated with transportation projects have the potential to accelerate delivery of runoff to area waterways and reduce groundwater infiltration.

The proposed action will increase impervious surface by approximately 2,500 square feet for the East Broadway Bridge and 6,300 square feet for the 12th Avenue Bridge. While the proposed stormwater drainage systems constitute an improvement of existing direct drainage systems and do appear to provide some over-ground flow before entering waterways, they provide only minimal attenuation of peak flow.

1.5.2 Effects on Critical Habitat

The NMFS designates critical habitat based on physical and biological features that are essential to the listed species. Essential features of designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Effects to critical habitat from these categories are included in the effects description expressed above in section 1.5.1, *Effects of Proposed Action*.

The proposed actions will affect critical habitat. In the short term, NMFS expects a temporary increase of sediments and turbidity, and disturbance of riparian and in-stream habitat. In the long term, habitat function will continue to be impaired where bridge abutments are placed; however, water quality may improve as a result of the collection and drainage of roadway runoff to water treatment manholes.

While the bridge abutments have been set slightly shoreward of the existing structures, they do not allow natural lateral channel migration. Arresting channel migration may simplify the channel and alter hydraulic processes (Spence *et al.* 1996). However, urban development in the action areas also restricts channel migration, so the abutments do not constitute the sole source of this effect, nor is significant restoration of channel migration feasible.

1.5.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Future Federal actions, including the ongoing operation of hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action.

NMFS is not aware of any specific future non-federal activities within the action area that would cause greater effects to listed species than presently occur. NMFS assumes that future private and state actions will continue at similar intensities as in recent years. As the human population in the state continues to grow, demand for actions similar to the subject project likely will continue to increase as well. Each subsequent action by itself may have only a small incremental effect, but taken together they may have a significant effect that would further degrade the watershed's environmental baseline and undermine the improvements in habitat conditions necessary for listed species to survive and recover.

1.6 Conclusion

After reviewing the current status of the listed species, the environmental baseline for the action areas, the effects of the proposed bridge removal and construction, and cumulative effects, NMFS has determined that the East Broadway Bridge and 12th Avenue Bridge Replacement Projects, as proposed, are not likely to jeopardize the continued existence of OC coho salmon, and is not likely to destroy or adversely modify designated critical habitat for this ESU. This finding is based, in part, on incorporation of BMPs into the proposed project design (e.g., in-water work limitations, containment of construction material, and containment of suspended sediments during pile removal and installation), but also on the following considerations: 1) A majority of in-water work will occur when coho salmon are present in relatively low numbers; 2) removal of the existing treated wood piles will reduce the long-term contribution of PAHs to the habitat; 3) the proposed design minimizes the number of in-stream structures and provides some treatment of stormwater runoff; 4) wetland enhancement acreage exceeds acreage filled by a 3:1 ratio; and 5) restoration of channel migration is not feasible due to urban development in the action area.

1.7 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitats, or to develop additional information. The NMFS believes the following conservation recommendations are consistent with these obligations, and therefore should be carried out by the Corps:

Recommendation #1: The NMFS recommends the Corps reconsider the stormwater drainage system to determine if vegetated stormwater detention facilities can be incorporated into the project to minimize peak streamflow changes.

Recommendation #2: The NMFS recommends the Corps require wetland mitigation occur during calendar year 2002 at an appropriate time to maximize planting success. In order to minimize temporal effects of wetland loss, this recommendation is made regardless of the year in which replacement of the East Broadway Bridge occurs.

Recommendation #3: The NMFS recommends the Corps not reduce tidal wetland acreage in Oregon coastal estuaries.

In order for the NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed salmon and their habitats, NMFS requests notification of any actions leading to the achievement of these conservation recommendations.

1.8 Reinitiation of Consultation

This concludes formal consultation on these actions in accordance with 50 CFR 402.14(b)(1). Reinitiation of consultation is required: (1) If the amount or extent of incidental take is exceeded; (2) the action is modified in a way that causes an effect on the listed species that was not previously considered in the biological assessment and this Opinion; (3) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered species and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Harm is further defined by NMFS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, and sheltering (50 CFR 217.12). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered to be a prohibited taking under the ESA provided that such taking is in compliance with the term and conditions of this incidental take statement.

2.1 Amount or Extent of Take

NMFS anticipates that the proposed action covered by this Opinion has more than a negligible likelihood of incidental take of listed species resulting from the demolition and construction of the subject bridge structures. Effects of actions such as these are largely unquantifiable in the short term, but are expected to be largely limited to non-lethal take in the form of behavior modification. The effects of these activities on population levels are also largely unquantifiable and not expected to be measurable in the long term.

Therefore, even though NMFS expects some low level of non-lethal incidental take to occur due to the action covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species themselves. In instances such as this, NMFS designates the expected level of take in terms of the extent of take allowed. Therefore, NMFS limits the extent of allowable incidental take during construction to that aquatic area below the mean higher-high water elevation or 10-year flood elevation, whichever is greater, from point 0.5 mile upstream of the particular bridge crossing downstream to the Pacific Ocean. Incidental take occurring outside the scope of the proposed action or beyond these areas is not authorized by this consultation. This incidental take statement terminates on February 15, 2006.

2.2 Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the above species.

1. Minimize the likelihood of incidental take from construction activities in or near watercourses by requiring pollution and erosion control measures.
2. Minimize the likelihood of incidental take associated with effects to riparian and in-stream habitats by requiring the avoidance or replacement of lost riparian and in-stream functions.
3. Minimize the likelihood of incidental take associated with in-stream work by restricting work to recommended in-water work periods
4. Ensure this biological opinion is meeting its objective of minimizing the likelihood of take from permitted activities by requiring comprehensive monitoring and reporting.

2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To Implement Reasonable and Prudent Measure #1 (pollution and erosion control), the Corps shall ensure that:
 - a. The PCP prevents any existing stormwater runoff system from conveying potential pollutants from a project staging area (particularly fueling, maintenance, and pollutant storage areas) to any waterway.
 - b. The water-quality manholes are inspected/maintained no less frequently than once per year for a period of 5 years following installation, and that the applicant

develop an inspection/maintenance plan based on the 5-year inspection information suitable to assure adequate facility function.

- c. Material removed from the water-quality manholes during maintenance (e.g., petroleum contaminated water and sediments) shall be properly disposed of in accordance with state and Federal law.
2. To Implement Reasonable and Prudent Measure #2 (riparian and in-stream habitat), the Corps shall ensure that:
- a. The Engineer shall identify and mark the clearing limits. Do not begin construction activity or move equipment into existing vegetated areas until clearing limits are marked.
 - b. Material removed during excavation will only be placed in locations where it cannot enter sensitive aquatic resources. Whenever topsoil is removed, it will be stored and reused onsite to the greatest extent possible.
 - c. Alteration or disturbance of the stream banks and existing riparian vegetation will be minimized to the greatest extent possible.
 - d. All existing vegetation within 150 feet of the edge of bank will be retained to the greatest extent possible.
 - e. Plantings achieve an 80 percent survival success after five years.
 - f. Plantings use only native species.
 - g. During the establishment period of planted areas, control invasive, non-native plants, including Himalayan blackberry (*Rubus discolor*), Canada thistle (*Cirsium arvense*), teasel (*Dipsacus sylvestris*), and reed canary grass (*Phalaris arundinacea*), by hand pulling and/or cutting prior to going to seed.
3. To Implement Reasonable and Prudent Measure #3 (in-stream work), the Corps shall ensure that:
- a. In-water work shall be defined as any activity occurring below the mean higher-high water or 10-year flood elevation, whichever is greater.
 - b. Survey and mark the mean higher-high water elevation or 10-year flood elevation, whichever is greater is surveyed and marked, prior to construction to delineate the in-water work area.
 - c. All in-water work shall be completed within the work period of January 1 and February 15. In-water work includes, but is not limited to:
 - i. Removal of existing bridge.

- ii. Removal of existing bridge piles.
 - iii. Driving new bridge piling, including sheet pile.
 - iv. Bank shaping at toe of abutments.
 - v. Driving temporary utility support structure piles at 12th Avenue Bridge.
 - d. No in-water work shall take place outside this period without prior written authorization from the Corps (in consultation with NMFS), except pile removal for the temporary utility support structure at 12th Avenue.
 - e. Temporary utility support structure pile removal at 12th Avenue shall occur prior to May 25 of the year of installation under the following condition:
 - i. The applicant, or their authorized designee, shall contact NMFS (Rob Markle, 503-230-5419) prior to commencing removal activities to confirm intended methods and timing.
4. To Implement Reasonable and Prudent Measure #4 (monitoring and reporting), the Corps shall ensure that:
- a. Annually, a monitoring report will be submitted by July 1 for any work completed under this Opinion until the action is completed in full, including confirmation of planting success and inspection of water-quality manhole performance. This report will consist of the following information.
 - i. Project identification.
 - (1) Permit number;
 - (2) applicant's name;
 - (3) project name;
 - (4) project location by 5th field hydrological unit code (HUC) and latitude and longitude;
 - (5) starting and ending dates for work performed under the permit; and
 - (6) the Corps contact person.
 - ii. Construction. Provide NMFS with a report describing the success of conservation measures, confirmation of as-built design, and planting success. This section will be submitted as outlined below.
 - (1) Specific methods actually used to contain turbidity, including details of turbidity curtain deployment and sand collars;
 - (2) Stream conditions prior to and following placement and removal of curtains;
 - (3) Any problems experienced with containment measures and turbidity curtains;
 - (4) Pile extraction success, including number of piles snapped and buried during extraction; and
 - (5) Any mortality of fish resulting from project activities.
 - iii. Construction Site Revegetation. This component of the monitoring report, including photo documentation, shall focus on actions taken to ensure that

- plantings were done correctly and success at meeting the objective of 80 percent or higher survival rate after five years;
- iv. Water-quality Manhole Inspection. Submit findings of manhole inspections during 5-year monitoring period, including:
 - (1) Volume and character of sediments accumulated or removed;
 - (2) Presence of oil contaminated water;
 - (3) Disposal location of any removed material; and
 - (4) Proposed inspection/maintenance plan.
 - v. Mitigation Site. This section of the monitoring report, including photo documentation, shall focus on confirming the success of the mitigation effort in enhancing the condition of the subject wetland.
- b. The monitoring report shall be submitted to:
- National Marine Fisheries Service
Habitat Conservation Division
Attn: OSB2001-0302-FEC
525 NE Oregon Street, Suite 500
Portland, OR 97232
- c. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the National Marine Fisheries Service Law Enforcement Office, at the Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed.

3. MAGNUSON-STEVENS ACT

3.1 Background

On December 6, 2001, the NMFS received a letter from the Corps requesting Essential Fish Habitat (EFH) consultation for the subject action pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and its implementing regulations (50 CFR 600). The objective of the EFH consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the Magnuson-Stevens Act requires Federal agencies to consult with NMFS on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Stevens Act §3). For the purpose of interpreting the definition of essential fish habitat: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the Magnuson-Stevens Act (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NMFS shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations.

The Magnuson-Stevens Act requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH.

Therefore, EFH consultation with NMFS is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of their locations.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (200 miles)

(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (e.g., natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to The Pacific Coast Groundfish Management Plan (PFMC 1998a) and the NMFS Essential Fish Habitat for West Coast Groundfish Appendix (Casillas *et al.* 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the Coastal Pelagic Species Fishery Management Plan (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

3.4 Proposed Actions

The proposed actions are detailed above in Section 1.2 and the action areas defined in Section 1.4.2 of this document. These action areas have been designated as EFH for various life stages of numerous groundfish, coastal pelagic fish, and salmon species (Table 1).

3.5 Effects of Proposed Action

As described in detail in Section 1.5 of this document, the proposed activities may result in short- and long-term adverse effects to a variety of habitat parameters. In summary, these impacts include:

Effect #1: Disturbance - Pile driving activities have the potential to delay adult coho salmon migration and influence juvenile behavior.

Effect #2: Turbidity - Ground disturbance activities, pile extraction, and pile driving can suspend soils and sediments, and increase turbidity.

Effect #3: Wetlands - The widened road prism at the East Broadway Bridge will result in an 860-square foot reduction in wetlands.

Effect #4: Hazardous Materials - Pile extraction may suspend and distribute PAH-contaminated sediments within the subject reaches, roadway drainage systems may convey contaminated stormwater to waterways, and accidental release of fuel, oil, and other contaminants may occur during construction.

Effect #5: Predation - Predation may increase where barges are used during juvenile coho salmon outmigration periods, and piscivorous bird predation opportunities will continue to be provided by the bridges themselves.

Effect #6: Hydrologic Cycle - Impervious surfaces and stormwater conveyance systems have the potential to accelerate runoff and reduce groundwater infiltration.

3.6 Conclusion

NMFS believes that the proposed action may adversely affect the EFH for the groundfish, coastal pelagic, and Pacific salmon species listed in Table 1.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. NMFS finds the conservation measures proposed for the project in the BA and summarized above in Section 1.2, all conservation recommendations outlined above in Section 1.7, and all of the reasonable and prudent measures and the terms and conditions contained in Sections 2.2 and 2.3 are applicable. Therefore, NMFS incorporates each of those measures here as EFH conservation recommendations.

3.8 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NMFS after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NMFS, the agency must explain its reasons for not following the recommendation.

3.9 Consultation Renewal

The Corps must reinitiate EFH consultation with NMFS if either action is substantially revised or new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920).

Table 1. Species with designated EFH found in waters of the State of Oregon.

Ground Fish Species	Blue rockfish (<i>S. mystinus</i>)	Rougheye rockfish (<i>S. aleutianus</i>)	Flathead sole (<i>Hippoglossoides elassodon</i>)
Leopard shark (<i>Triakis semifasciata</i>)	Bocaccio (<i>S. paucispinis</i>)	Sharpchin rockfish (<i>S. zacentrus</i>)	Pacific sanddab (<i>Citharichthys sordidus</i>)
Soupfin shark (<i>Galeorhinus zyopterus</i>)	Brown rockfish (<i>S. auriculatus</i>)	Shortbelly rockfish (<i>S. jordani</i>)	Petrale sole (<i>Eopsetta jordani</i>)
Spiny dogfish (<i>Squalus acanthias</i>)	Canary rockfish (<i>S. pinniger</i>)	Shortraker rockfish (<i>S. borealis</i>)	Rex sole (<i>Glyptocephalus zachirus</i>)
Big skate (<i>Raja binoculata</i>)	Chilipepper (<i>S. goodei</i>)	Silvergray rockfish (<i>S. brevispinus</i>)	Rock sole (<i>Lepidopsetta bilineata</i>)
California skate (<i>R. inornata</i>)	China rockfish (<i>S. nebulosus</i>)	Speckled rockfish (<i>S. ovalis</i>)	Sand sole (<i>Psettichthys melanostictus</i>)
Longnose skate (<i>R. rhina</i>)	Copper rockfish (<i>S. caurinus</i>)	Splitnose rockfish (<i>S. diploproa</i>)	Starry flounder (<i>Platyichthys stellatus</i>)
Ratfish (<i>Hydrolagus collieri</i>)	Darkblotched rockfish (<i>S. crameri</i>)	Stripetail rockfish (<i>S. saxicola</i>)	
Pacific rattail (<i>Coryphaenoides acrolepis</i>)	Grass rockfish (<i>S. rastrelliger</i>)	Tiger rockfish (<i>S. nigrocinctus</i>)	Coastal Pelagic Species
Lingcod (<i>Ophiodon elongatus</i>)	Greenspotted rockfish (<i>S. chlorostictus</i>)	Vermillion rockfish (<i>S. miniatus</i>)	Northern anchovy (<i>Engraulis mordax</i>)
Cabezon (<i>Scorpaenichthys marmoratus</i>)	Greenstriped rockfish (<i>S. elongatus</i>)	Widow Rockfish (<i>S. entomelas</i>)	Pacific sardine (<i>Sardinops sagax</i>)
Kelp greenling (<i>Hexagrammos decagrammus</i>)	Longspine thornyhead (<i>Sebastolobus altivelis</i>)	Yelloweye rockfish (<i>S. ruberrimus</i>)	Pacific mackerel (<i>Scomber japonicus</i>)
Pacific cod (<i>Gadus macrocephalus</i>)	Shortspine thornyhead (<i>Sebastolobus alascanus</i>)	Yellowmouth rockfish (<i>S. reedi</i>)	Jack mackerel (<i>Trachurus symmetricus</i>)
Pacific whiting (Hake) (<i>Merluccius productus</i>)	Pacific Ocean perch (<i>S. alutus</i>)	Yellowtail rockfish (<i>S. flavidus</i>)	Market squid (<i>Loligo opalescens</i>)
Sablefish (<i>Anoplopoma fimbria</i>)	Quillback rockfish (<i>S. maliger</i>)	Arrowtooth flounder (<i>Atheresthes stomias</i>)	
Aurora rockfish (<i>Sebastes aurora</i>)	Redbanded rockfish (<i>S. babcocki</i>)	Butter sole (<i>Isopsetta isolepsis</i>)	Salmon
Bank Rockfish (<i>S. rufus</i>)	Redstripe rockfish (<i>S. proriger</i>)	Curlfin sole (<i>Pleuronichthys decurrens</i>)	Coho salmon (<i>O. kisutch</i>)
Black rockfish (<i>S. melanops</i>)	Rosethorn rockfish (<i>S. helvomaculatus</i>)	Dover sole (<i>Microstomus pacificus</i>)	Chinook salmon (<i>O. tshawytscha</i>)
Blackgill rockfish (<i>S. melanostomus</i>)	Rosy rockfish (<i>S. rosaceus</i>)	English sole (<i>Parophrys vetulus</i>)	

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on the best scientific and commercial data available. This section identifies the data used in developing this Opinion.

Berg, L. and T.G. Northcote. 1985. "Changes In Territorial, Gill-Flaring, and Feeding Behavior in Juvenile Coho Salmon (*Oncorhynchus kisutch*) Following Short-Term Pulses of Suspended Sediment." Canadian Journal of Fisheries and Aquatic Sciences 42:1410-1417.

Casillas, E., L. Crockett, Y. deReynier, J. Glock, M. Helvey, B. Meyer, C. Schmitt, M. Yoklavich, A. Bailey, B. Chao, B. Johnson and T. Pepperell. 1998. Essential Fish Habitat West Coast Groundfish Appendix. National Marine Fisheries Service. Seattle, Washington. 778 p

Feist, B.E., J.J. Anderson, and R. Miyamoto. 1996. Potential Impacts of Pile Driving on Juvenile Pink (*Oncorhynchus gorbuscha*) and Chum (*O. keta*) Salmon Behavior and Distribution. Fisheries Research Institute, School of Fisheries, University of Washington, Seattle, Washington. 58 p.

Floyd, R. 2000. ODOT Culvert Retrofit Research: Program analysis of fish passage through retrofitted culverts, Biological Assessment. Oregon Department of Transportation, Salem, OR. May 25.

Johnson, L. 2000. An analysis of support of sediment quality thresholds for polycyclic aromatic hydrocarbons (PAHs) to protect estuarine fish. National Marine Fisheries Service, Seattle, WA. July 24.

Neff, J.M. 1985. Polycyclic aromatic hydrocarbons. Pages 416-454 in Fundamentals of aquatic toxicology, G.M. Rand and S.R. Petrocelli. Hemisphere Publishing, Washington, D.C.

Nickelson, T.E., J.W. Nicholas, A.M. McGie, R.B. Lindsay, D.L. Bottom, R.J. Kaiser, and S.E. Jacobs. 1992. Status of anadromous salmonids in Oregon coastal basins. Oregon Department of Fish and Wildlife, Research Development Section and Ocean Salmon Management, 83 p. Oregon Department of Fish and Wildlife, P.O. Box 59, Portland.

Oregon Department of Environmental Quality (ODEQ). 2001. Oregon's Final 1998 Water Quality Limited Streams - 303(d) List. <<http://waterquality.deq.state.or.us>>. Accessed on December 6, 2001.

Oregon Department of Fish and Wildlife (ODFW). 2001. Annual estimate of wild coho spawner abundance in coastal river basins within the Oregon Coastal ESU, 1990-2000.

Found at <<http://osu.orst.edu/Dept/ODFW/spawn/coho.htm>> under Stratified Random Sampling Estimates for Coastal River Basins 1990-2000. Accessed on December 28, 2001.

- PFMC (Pacific Fishery Management Council). 1998a. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan.
- PFMC (Pacific Fishery Management Council). 1998b. The Coastal Pelagic Species Fishery Management Plan: Amendment 8. Portland, Oregon.
- PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan - Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.
- Spence, B.C., G.A. Lomnický, R.M. Hughes, and R.P. Novitzki. 1996. An Ecosystem Approach to Salmonid Conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon. (Available from the National Marine Fisheries Service, Portland, Oregon). 356 p.
- Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington.